A NEW SPECIES AND NOMENCLATURAL CHANGES IN THE SUBGENUS *POLYRHACHIS (CYRTOMYRMA)* FOREL (HYMENOPTERA: FORMICIDAE: FORMICINAE)

RUDOLF J. KOHOUT

Biodiversity Program, Queensland Museum, PO Box 3300, South Brisbane, Qld 4101

(Email: rudolf.kohout@qm.qld.gov.au)

Abstract

Polyrhachis dorowi sp. n., a new species of the subgenus *Cyrtomyrma* Forel from Cape York Peninsula, Queensland, is described and illustrated. *Polyrhachis busiris* Fr. Smith, 1860, from New Guinea, is removed from synonymy with *P. rastellata* (Latreille, 1802), redescribed and reinstated as a valid species; a lectotype is also designated. *Polyrhachis rastellata baduri* Donisthorpe, 1941, from Japen Island off the northwestern coast of Irian Jaya [= West Papua], Indonesia, is considered a new synonym of *P. euryala* Fr. Smith, 1863. The occurrence of *P. debilis* Emery in Australia, earlier considered doubtful, is now confirmed by specimens from Melville Island, off the coast of the Northern Territory.

Introduction

During a recent examination of *Cyrtomyrma* Forel material from Cape York Peninsula, Queensland, I come upon several colonies of an apparently undescribed species. This species has a highly arched mesosoma and somewhat resembles a number of recently described Australasian species, notably *Polyrhachis robsoni* Kohout from Queensland and *P. hybosa* Kohout and *P. tuberosa* Kohout from New Guinea (see Kohout 2006). However, the new species differs from *P. robsoni* in having the pronotal shoulders widely rounded, while they are toothed or angular in the latter. From *P. hybosa* and *P. tuberosa* the new species differs by its generally smaller size and the form of the mesosoma, which is shorter, more slender and steeply descends from the summit towards the propodeal declivity. I consider that the characters separating these taxa warrant the description of the above specimens from Cape York Peninsula as a new species.

On a recent visit to the Oxford University Museum of Natural History (OXUM), I located both syntypes of *P. busiris* Fr. Smith listed by Smith (1860: 98) in his original description of the species. The specimens were placed in the Museum's general collection, not with the other type material of species collected by Alfred Russell Wallace and described by Frederick Smith. This is probably why the syntypes of *P. busiris* remained virtually unknown and were apparently missed by later researchers.

Publication dates and the spelling of species epithets and authors' names follow Bolton (1995) and Dorow (1995). Original collecting localities were checked against the Bishop Museum's unpublished list of New Guinea localities, produced in 1966. In some cases the latitude and longitude co-ordinates are only roughly approximate. The use of the words 'New Guinea' or 'Moluccas' alone indicates the delimitation of these regions in a biogeographical sense, regardless of current political boundaries.

Methods

Photographs of the specimens were taken with a digital camera attached to a stereomicroscope and processed using Auto-Montage (Syncroscopy, Division of Synoptics Ltd, USA) and Adobe Photoshop CS2 (Adobe Systems Inc, USA). All digital images depict the primary types.

Standard Measurements and Indices: TL = Total length (the necessarily composite measurement of the outstretched length of the entire ant measured in profile); HL = Head length (the maximum measurable length of the head in perfect full face view, measured from the anterior-most point of the clypeal border or teeth, to the posterior-most point of the preoccipital margin); HW = Head width (width of the head in perfect full face view, measured immediately in front of the eyes); CI = Cephalic index (HW x 100/HL); SL = Scape length (excluding the condyle); SI = Scape index (SL x 100/HW); PW = Pronotal width (maximum width of the pronotal dorsum excluding the spines); MTL = Metathoracic tibial length (maximum measurable length of the tibia of the hind leg). Measurements were taken using a Zeiss SR stereomicroscope at 32x magnification with an eyepiece graticule calibrated against a stage micrometer. All measurements are in millimetres (mm).

Abbreviations used for specimen data are: acc. = accession; for. = forest; q = queen; R. = River; RJK = R.J. Kohout; rf. = rainforest; w = worker/s; WHOD = Wolfgang H.O. Dorow.

Abbreviations used for Institutions (with names of cooperating curators) are: AMNH – American Museum of Natural History, New York, NY, USA (Dr J.M. Carpenter); ANIC – Australian National Insect Collection, CSIRO Entomology, Canberra, ACT, Australia (Drs S.O. Shattuck, R.W. Taylor); BMNH – The Natural History Museum, London, UK (Dr Barry Bolton, K. Goodger); BPBM – Bernice P. Bishop Museum, Honolulu, HI, USA (K.T. Arakaki); CASC – California Academy of Sciences, San Francisco, CA, USA (Dr B.L. Fisher); JWGU – Johan Wolfgang Goethe-Universität, Frankfurt am Main, Germany (Prof. Dr U. Maschwitz); MCZC – Museum of Comparative Zoology, Harvard University, Cambridge, MA, USA (Dr S.P. Cover); MHNG – Muséum d'Histoire Naturelle, Geneva, Switzerland (Drs C. Besuchet, I. Löbl, B. Merz); MNHA – Museum of Nature and Human Activities, Sanda, Hyogo, Japan (Dr Yoshiaki Hashimoto); MNHU – Museum für Naturkunde, Humboldt-Universität, Berlin, Germany (Dr F. Koch); NHMW – Naturhistorisches Museum, Vienna, Austria (Drs M. Fisher, S. Schödl, H. Zettel); NMNH – National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (Dr T.R. Schultz); OXUM – Hope Entomological Collections, University Museum, Oxford, UK (Dr D.J. Mann); QMBA – Queensland Museum, Brisbane, Qld, Australia (Drs C.J. Burwell, G.B. Monteith); SMFG – Forschungsinstitut Senckenberg, Frankfurt am Main, Germany (Dr W.H.O. Dorow); SNSD – Staatliche Naturhistorische Sammlungen, Museum für Tierkunde, Dresden, Germany

(Drs R. Emmrich, U. Kallweit); TERC – Tropical Ecosystems Research Centre, CSIRO, Darwin, NT, Australia (Dr A.N. Andersen).

Systematics

Polyrhachis dorowi sp. n.

(Figs 1, 4-5)

Types. Holotype worker, AUSTRALIA (QUEENSLAND): Cape York Peninsula, Lockerbie Scrub, 10°46'S, 142°29'E, 23-26.ix.2003, lowland rf., ex nest between leaves, W.H.O. Dorow (RJK acc. 03.10). *Paratypes*: 55 workers, same data as holotype; 29 workers, 5 ♀♀, 9 ♂♂, same data as holotype except 19-23.iii.1987 (RJK accs 87.36, 37, 44, 51, 66, 68). Holotype (QMT 152066) and most paratypes in QMBA; 3 paratype workers and paratype ♀ in ANIC; 2 paratype workers each in BMNH, CASC, MCZC, MHNG, MNHU, NHMW, NMNH and SMFG.

Additional material examined. AUSTRALIA (QUEENSLAND): Cape York Peninsula, Bamaga, 10°53'S, 142°23'E, 26.ix.2003, riparian rf., (RJK acc. 03.19) (w).

Description. Worker. Dimensions (holotype cited first): TL *c.* 6.00, 5.14-6.25; HL 1.53, 1.34-1.56; HW 1.50, 1.22-1.53; CI 98, 91-98; SL 1.87, 1.65-1.93; SI 125, 124-135; PW 1.18, 1.03-1.25; MTL 2.15, 1.84-2.18 (24 measured). Mandibles with five teeth. Anterior clypeal margin with truncate, medially notched central flange, laterally flanked by acute denticles. Clypeus in profile straight or very weakly convex, posteriorly rounding into moderately impressed basal margin. Frontal triangle weakly indicated. Frontal carinae sinuate with margins moderately raised at mid-length, rather flat anteriorly and posteriorly; central area with moderately impressed frontal furrow. Sides of head in front of eyes weakly convex towards mandibular bases; behind eyes rounding into moderately convex occipital margin. Eyes relatively large, convex, in full-face view clearly breaking lateral cephalic outline. Ocelli lacking. Pronotum in lateral view with anterior face rising very steeply towards narrow summit situated in front of strongly impressed promesonotal suture. Pronotal humeri in dorsal view rounded with greatest width of pronotum just before mid-length of segment. Mesosomal dorsum steeply descending towards propodeal declivity; metanotal groove lacking. Petiole relatively low, virtually triangular in lateral view with anterior and posterior faces weakly convex; dorsal margin armed with four spines, dorsal pair short, close together and broad-based, lateral pair diverging, slender and more acute. Subpetiolar process acute anteriorly, narrowly rounded posteriorly. Anterior face of first gastral segment about as high as full height of petiole, widely rounding onto dorsum of gaster.

Mandibles very finely, longitudinally striate with numerous piliferous pits. Dorsum of head, mesosoma and gaster finely shagreened. Intensity of mesosomal sculpturation distinctly increasing laterally with lower portions of pronotum, meso- and metapleurae rather strongly reticulate-rugose. Petiole mostly transversely wrinkled dorsally, becoming reticulate-rugose near base.

Mandibular masticatory borders with numerous curved hairs. Anterior clypeal margin medially with a few golden setae and several shorter setae fringing margin laterally. A few pairs of longer hairs arising near anterior and basal clypeal margins, along frontal carinae, on vertex and anterior face of frontal coxae. Tuft of long, variously curved hairs, not exceeding greatest diameter of eye in length, situated on summit of mesonotum. Numerous, distinctly shorter hairs arising along margins of segments and around apex of gaster.

Black; mandibular teeth, extreme tip of apical antennal segment and most of legs reddish-brown; proximal part of tibiae and tarsi black.

Queen. Dimensions: TL *c.* 7.51-8.01; HL 1.72-1.81; HW 1.53-1.64; CI 88-91; SL 2.00-2.12; SI 122-133; PW 1.68-1.84; MTL 2.37-2.59 (5 measured). Closely resembling worker and apart of sexual characters differing as follows: eyes only moderately convex, in full face view just breaking lateral cephalic outline; pronotal humeri subangular; mesoscutum in dorsal view wider than long with lateral margins converging anteriorly into broadly rounded anterior margin; median line bifurcate dorsally. In lateral view mesoscutum relatively high with anterior margin widely rounding onto flat dorsum; parapsides rather flat anteriorly, weakly raised posteriorly; mesoscutellum in profile weakly convex, moderately elevated above dorsum of mesosoma; metanotal groove distinct; propodeum with rudimentary tubercles; propodeal dorsum convex in profile evenly descending into vertical declivity. Body sculpturation, pilosity and colour as in worker.

Males and immature stages (eggs, larvae and pupae) deposited in the QMBA spirit collection.

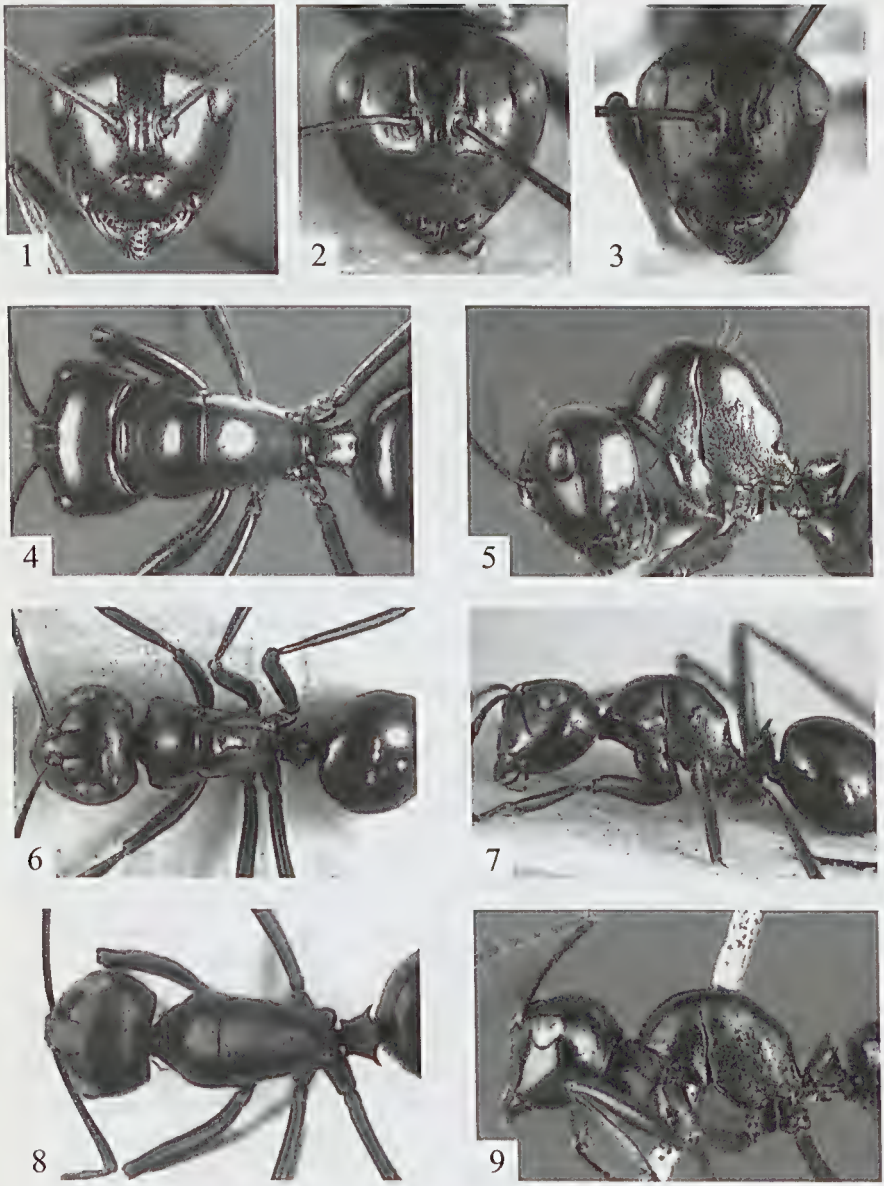
Etymology. After the collector of the type series, Dr Wolfgang H.O. Dorow of the Senckenberg Institute, Frankfurt am Main, Germany.

Remarks. *Polyrhachis dorowi* is characterised by the highly arched mesosoma and steeply rising anterior face of pronotal dorsum with its summit just before the promesonotal suture. It can be identified by the following modification to the key to Australian species in Kohout (2006). Figure numbers in square brackets refer to illustrations in the original article (Kohout 2006).

15 Antennal scapes longer (SI >140); lateral petiolar spines longer than dorsal pair (Fig. 8) (Indonesia, New Guinea) ..... (*P. euryala* Fr. Smith)

– Antennal scapes shorter (SI <135); lateral and dorsal petiolar spines subequal in length 16

16 Pronotum in dorsal view strongly transverse, humeri bluntly angular or narrowly rounded; petiole with sides only weakly diverging dorsally (mid- to southern Queensland) [Fig. 4 C-D] ..... *P. mackayi* Donisthorpe



Figs 1-9. *Polyrhachis dorowi* sp. n., holotype worker: (1) head in full-face view; (4) dorsal view; (5) lateral view. *Polyrhachis busiris* Fr. Smith, lectotype worker: (2) head in full-face view; (6) dorsal view; (7) lateral view. *Polyrhachis euryala* Fr. Smith, syntype worker: (3) head in full-face view; (8) dorsal view; (9) lateral view.

– Pronotum in dorsal view only weakly transverse, humeri widely rounded; petiole with sides more strongly diverging dorsally (far northern Queensland) 17

17 Mesosoma in lateral view more-or-less evenly rounded with very steep, almost vertical propodeal declivity [Fig. 2 A, D-E] ... *P. delecta* Kohout

– Mesosoma in lateral view highly arched with anterior face of pronotum steeply rising towards narrow summit; mesonotal and propodeal dorsa steeply descending posteriorly towards oblique declivity (Fig. 5) .... *P. dorowi* sp. n.

Polyrhachis busiris Fr. Smith, 1860, stat. rev.

(Figs 2, 6-7)

Polyrhachis busiris Fr. Smith, 1860: 98, pl. 1, fig. 15. Syntype workers (2). Original localities: NEW GUINEA, Dory (= IRIAN JAYA, Manokwari) (A.R. Wallace); INDONESIA, Batjan I. (A.R. Wallace), OXUM (examined).

Polyrhachis busiris Fr. Smith; Mayr, 1862: 688. Junior synonym of *rastellata* (Latreille, 1802).

Additional material examined. INDONESIA (IRIAN JAYA [= WEST PAPUA]): Baitenissa, Gesa R., 02.09°S, 137.43°E, ~20 m, 6-12.v.2007, lowland swamp for., ex carton nest on tree trunk (R.R. Snelling # 07-052) (w).

Lectotype designation. Both syntypes of *P. busiris* are card mounted and in relatively good condition. In addition to BMNH blue disc 'Syntype' tags, they are both furnished with Hope Department, Oxford labels inscribed '*Polyrachis* (sic) *busiris* Smith', one with 1179 1/2 and the other with 1179 2/2. The latter specimen also bears a round, white disc inscribed 'Dor.' (= Dory) and an apparently original, handwritten label inscribed '*Polyrhachis Busiris* Smith'. Its petiole matches the figure given in the original article (Smith 1860: pl. 1, fig. 15) and, in order to maintain nomenclatural stability and preserve current usage, this specimen is here designated the lectotype of *P. busiris* Fr. Smith. The other specimen, which bears a round disc inscribed 'Bac.' (= Bachian; = Batjan I.), is deemed a paralectotype. This is the specimen that was apparently examined by Donisthorpe and furnished with two additional labels referring to the citation of this species in his paper on Smith's types (Donisthorpe 1932: 460). However, closer examination reveals that the paralectotype is not conspecific with the lectotype. It clearly represents a different species that is very similar to *Polyrhachis fornicata* Emery (see Kohout 2008) and most likely represents a Moluccan population of that species.

Redescription. Worker: Dimensions (lectotype cited first): TL *c.* 6.80, 6.40-7.06; HL 1.78, 1.65-1.78; HW 1.84, 1.62-1.84; CI 103, 96-103; SL 2.15, 2.00-2.15; SI 117, 117-123; PW 1.43, 1.31-1.43; MTL 2.59, 2.43-2.62 (19 measured).

Head, excluding mandibles, about as long as wide. Mandibles with five teeth, apical tooth largest with subsequent teeth reducing in length towards base. Anterior clypeal margin with central truncate flange, shallowly notched medially and flanked laterally by acute denticles. Clypeus in profile weakly convex with basal margin moderately impressed. Frontal triangle poorly indicated. Frontal carinae sinuate with only weakly raised margins; frontal furrow shallowly impressed. Sides of head in front of eyes strongly converging towards mandibular bases; behind eyes widely rounding into weakly convex occipital margin. Eyes moderately convex; in full face view not or just touching lateral cephalic outline. Ocelli lacking. Pronotum in dorsal view distinctly transverse with humeri angular or toothed. Mesosoma in profile more-or-less evenly convex; promesonotal suture distinct, metanotal groove lacking. Propodeum armed with distinct tuberculae or short teeth; declivity oblique. Petiole with anterior face straight, posterior face convex; dorsum armed with four, subequal, acute spines. Anterior face of first gastral segment lower than full height of petiole, widely rounding onto dorsum of segment.

Mandibles very finely and closely, mostly longitudinally, striate. Head, mesosoma and gaster finely shagreened. Intensity of sculpturation increasing laterally with sides of mesosoma distinctly reticulate and meso- and metapleurae rather strongly reticulate-rugose. Petiole finely, mostly transversely, reticulate dorsally, becoming reticulate-rugose around base.

Mandibles with numerous straight or weakly curved golden hairs arising near masticatory borders and numerous very short appressed hairs towards mandibular bases. Anterior clypeal margin with a few long, anteriorly directed, golden setae and several short setae fringing margin laterally. A few pairs of medium length, erect hairs arising near anterior and basal clypeal margins, along frontal carinae and on vertex. Several medium to long, mostly erect or somewhat curved hairs on front coxae, ventral surfaces of trochanters and apical segments of gaster. Tuft of a few semierect hairs on summit of mesonotum, with longest hairs reaching about half of greatest diameter of eye in length. Very short, closely appressed pubescence in various densities over most body surfaces.

Black throughout; joints of trochanters and femora and distal half of tibiae in modern specimens medium to dark reddish-brown.

Sexuals and immature stages unknown.

Remarks. Mayr (1862) considered *Polyrhachis busiris* to be a synonym of *P. rastellata* and his opinion was accepted by all subsequent authors, including Roger (1863), Dalla Torre (1893), Emery (1925), Donisthorpe (1932) and, more recently, Than (1978), Dorow (1995) and Bolton (1995). I examined and compared both *P. busiris* types with specimens interpreted earlier as *P. rastellata* (see Kohout 2006: 115) and believe that Mayr suggested this

synonymy without seeing the actual specimens. I consider his action to be incorrect and am confident in reinstating *P. busiris* to full specific status.

Polyrhachis busiris is similar to a number of New Guinean species that also feature distinctly angular or toothed pronotal humeri and a propodeal dorsum armed with spines, teeth or tuberculae. It can be distinguished by using the following key in addition to that in Kohout (2006).

1 Pronotal humeri in dorsal view produced into prominent teeth or bilobed 2

– Pronotal humeri distinctly angular or narrowly rounded 3

2 Propodeal spines long, dorsoventrally compressed, widely diverging and bluntly terminated (Aru Is) ..... *P. levior* Roger

– Propodeal spines very short, strongly upturned and acute .... *P. albertisi* Emery

3 Propodeum armed with a pair of distinct spines 4

– Propodeum armed with a pair of more-or-less distinct tuberculae .... *P. busiris* Fr. Smith

4 Propodeal spines long, dorsoventrally compressed, widely diverging and bluntly terminated; lateral petiolar spines distinctly elongated .... *P. barryi* Kohout

– Propodeal spines short, acute, strongly upturned; petiolar spines more-or-less subequal 5

5 Larger species (HL > 1.68); anterior face of pronotal dorsum in profile strongly convex; pronotal humeri narrowly rounded .... *P. linae* Donisthorpe

– Smaller species (HL < 1.56); pronotal dorsum in profile only weakly convex towards distinctly impressed promesonotal suture; pronotal humeri distinctly angular ..... *P. mondoi* Donisthorpe

Polyrhachis euryala Fr. Smith, 1863

(Figs 3, 8-9)

Polyrhachis euryalus Fr. Smith, 1863: 17. Syntype workers. Type locality: INDONESIA, Misool I. (A.R. Wallace), OXUM, BMNH (examined).

Polyrhachis euryalus Fr. Smith; Mayr, 1872: 138. Junior synonym of *P. rastellata* (Latreille, 1802).

Polyrhachis rastellata var. *euryalus* Fr. Smith; Emery, 1900: 720. Revived from synonymy as a variety of *P. rastellata* (Latreille, 1802).

Polyrhachis rastellata var. *torricelliana* Viehmeyer, 1912: 9, fig. 11. Syntype workers. Type locality: NEW GUINEA, Torricelli Mts ('Kais. Wilhelmsland, Toricelli Gebirge' on data label) (Schlaginhaufen), SNSD (examined). Synonymy by Viehmeyer, 1914: 50.

Polyrhachis (Cyrtomyrma) rastellata ssp. *euryalus* Fr. Smith; Emery, 1925: 208. Subspecies of *P. rastellata* (Latreille, 1802) and combination in *P. (Cyrtomyrma)*.

Polyrhachis (Cyrtomyrma) euryalus Fr. Smith; Donisthorpe, 1938: 259. Revived status as species.

Polyrhachis (Cyrtomyrma) rastellata var. *baduri* Donisthorpe, 1941: 63. Syntype workers, queen. Type locality: NEW GUINEA ('Dutch New Guinea' on data label), Japen I., Mt Baduri, 1,000 ft. viii.1938 (L.E. Cheesman B.M. 1938-593), BMNH, CASC, MCZC, QMBA (examined). Syn. n.

Additional material examined. INDONESIA (IRIAN JAYA [= WEST PAPUA]): Waris, S of Hollandia, 450-500 m, 1-7.viii.1959 (T.C. Maa) (w). PAPUA NEW GUINEA: 2 km E of Maprik, 03°38'S, 143°04'E, 200 m, 10.ii.1989 (P.S. Ward # 10165-8) (w); 1-2 km S of Pes Mission, *c.* 12 km WSW of Aitape, 03°11'S, 142°15'E, <50 m, 31.vii-3.viii.1984 (RJK acc. 84.172) (w, ♀).

Dimensions of *euryala* syntypes: TL *c.* 6.25-7.00; HL 1.53-1.56; HW 1.43; CI 92-93; SL 2.03-2.06; SI 142-144; PW 1.15; MTL 2.50 (2 measured).

Dimensions of *rastellata baduri* syntypes: TL *c.* 6.20-6.55; HL 1.59-1.65; HW 1.56-1.59; CI 94-100; SL 2.15-2.18; SI 135-140; PW 1.18-1.22; MTL 2.59-2.68 (2 measured).

Dimensions of *rastellata torricelliana* syntypes: TL *c.* 5.14-6.00; HL 1.43-1.50; HW 1.31-1.43; CI 92-95; SL 1.81-1.96; SI 137-138; PW 1.11-1.22; MTL 2.03-2.34 (2 measured).

Remarks. I have examined two syntypes each of *P. euryala* (OXUM, BMNH), *P. rastellata torricelliana* (SNSD) and *P. rastellata baduri* (BMNH, MCZC) and consider that they represent only different populations of a single species. All three taxa are characterised by widely rounded shoulders with the pronotal dorsum widest at around its mid-length. They differ somewhat in the outline of the petiole, with the lateral spines in *P. euryala* being more acute and longer than the dorsal pair, while in *P. rastellata torricelliana* and *P. rastellata baduri* the petiolar spines are more-or-less subequal and the lateral pair less divergent. However, examination of the additional material listed above reveals some variability in the length of the petiolar spines between different populations and I am confident that all three names represent a single biological species. Kohout (2006: 98) noted that *P. euryala* closely resembled *P. delecta* Kohout from Australia, sharing a distinctly slender mesosoma with widely rounded shoulders. However, they differ in the length of the antennal scapes, which are markedly shorter in *P. delecta* (SL 119-129) compared with those in *P. euryala* (SL 137-144). *Polyrhachis rastellata baduri* was erroneously omitted from my recent review of the New Guinean *Cyrtomyrma* species (Kohout 2006).

One of the three available syntypes of *P. rastellata torricelliana* is in fact a specimen of *P. wagneri* Viehmeyer, 1914; it closely matches most of the available syntypes (MNHU) of that species. Although Viehmeyer (1914)

listed only one specimen in the original description of *P. wagneri*, there are actually four available specimens labelled as types. However, on closer examination, one of the four also represents a second species and matches the types of *P. rastellata torricelliana*. Because Viehmeyer (1914) described *P. wagneri* in the same paper in which he synonymised *P. rastellata torricelliana* with *P. euryala*, I believe it is possible that some specimens of both species were accidentally mixed and mislabelled during their examination. *Polyrhachis wagneri* and *P. rastellata torricelliana* are very similar, with both featuring distinctly rounded pronotal shoulders. They differ in size (HL 1.65-1.68 in *P. wagneri* versus HL 1.43-1.50 in *P. rastellata torricelliana*) and in the shape of the petiole, which is exceptionally broad and with widely diverging lateral spines in *P. wagneri*. The propodeal dorsum in *P. wagneri* also bears a pair of very short, tooth-like spines or tubercles that are completely absent in *P. rastellata torricelliana*.

A newly confirmed Australian record

In my paper on the *Polyrhachis* and *Echinopla* ants of Queensland's Wet Tropics (Kohout 2000), I suggested that *P. debilis* Emery occurred in Australia. However, further study of the Queensland specimens originally thought to belong to that species confirmed their identity as *P. yorkana* Forel (Kohout 2006: 91). In the latter paper I also noted specimens similar to *P. debilis* that originated from Melville Island off the coast of the Northern Territory. As only a few specimens were available at that time and their relationship with *P. debilis* was inconclusive, they were considered to probably represent a new species. However, recent collecting on Melville Island by Dr Alan N. Andersen (TERC) produced sufficient material to allow a more detailed comparison with several available syntypes of *P. debilis*. Apart from some rather trivial differences, the two groups of specimens are very similar and, as a result, I consider the Melville Island specimens to represent an isolated population of *P. debilis*.

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